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O'FALLON

POLYTECHNIC INSTITUTE;

ITS OBJECTS AND PRESENT CONDITION.

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O'FALLON

POLYTECHNIC INSTITUTE;

ITS OBJECTS AND PRESENT CONDITION.

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O'FALLON POLYTECHNIC INSTITUTE.

ORIGIN.

On the 22d of February, 1853, a very liberal charter for educational purposes was passed by the General Assembly of Missouri, and under it a University was duly organized on the 22d of February, 1854. The plan of that University organization is more extensive in its range than any before adopted in the United States. It embraces, in addition to the ordinary courses of study in American Colleges, a Scientific Department in which the physical and abstract sciences are to be thoroughly taught, not theoretically only, but with direct reference to their useful application in the various industrial pursuits; and, also, a Practical or Industrial Department, in which are to be centered the more immediate and necessary facilities for practical information, interchange of thought, diffusion of scientific truths, proper development of mechanical and manufacturing skill, and whatever, in short, will in any manner promote the useful arts and give to them their proper educational position. The old view was discarded, that only a few callings are to be educated professions and all others mere trades, requiring but little beyond the training of the muscular system to a proper degree of physical skill —that the mechanical, manufacturing and other industrial pursuits are mere handicrafts, without the need of a full mastery of the various departments of abstract and applied science. Taking a wiser and grander view of the pressing wants of the age, and especially of the Mississippi Valley; recognizing the wonderful achievements of conjoined art and science during the last half century, whereby the industrial pursuits of the civilized world have undergone an almost complete revolution; knowing that a thorough knowledge of the immutable laws of nature which each mechanic, miner, manufacturer, engineer or artisan daily applies, is essential to a full and economical development of his department of industry; conscious that new combinations, analyses and applications of primary truths will lead to even greater than the present wonderful inventions, and open still larger fields for human enterprise; considering too, that the central position of St. Louis, particularly with reference to its mineral and commercial facilities, renders it the proper point at which to begin an educational enterprise for placing in possession of those who daily use the great agencies of nature, the proffered means of compelling those agencies to work out for man the result for which he is daily striving; fully aware, also, that the amount of practical information in the workshops of the country, never yet recorded in books, could be more usefully distributed by bringing together for a free interchange of thought, those who have gained such useful information through tradition and experience in their workshops—in a word, that educational preparation is just as important for the useful arts as for the so-called learned professions, and that the greatest expectations of future progress and power spring from the daily use by intelligent workmen in their various callings, of those properties of matter and forces of nature which science has now clearly developed —that both science and art must alike profit by rendering each mine, workshop and factory a practical laboratory and school of research where new truths are to be discovored and new applications of elemental principles made—with such results in view, that University determined to add a Practical or Industrial Department, to its other means of usefulness.

With the liberality and forecast for which he has ever been distinguished, Col. John O'Fallon promptly came forward to aid this Department, and gave for its endowment two blocks of ground in Union Addition, which in the rapid growth of that part of the city will ultimately prove the source of a large revenue.

During the spring of 1855, a few gentlemen directly connected with the mechanical and manufacturing enterprises of St. Louis, determined to found a Library and Reading Room for the industrial classes. Their attention was at first directed to the charter of the old Mechanics' Institute, but an examination of its powers, and a wish to blend mechanical and other interests in its management, so as to make the connection mutually beneficial, influenced them to organize under the University Charter already referred to, as its Industrial or Practical Department, for which the amplest powers existed. It was believed that the many advantages to be derived from such an organization could be procured so readily in no other way; as the Professors of its Scientific Department and the general educational advantages otherwise furnished, would contribute directly and largely to the advancement of the common design, and give greater strength and permanency to the undertaking. The University Board promptly granted the request, only requiring that an annual report should be made to it. and retaining the right to appoint four out of the twenty Managers to whom the control of the Department should be committed. Further than that the University has no immediate control over its management. The first four Managers appointed were Messrs. JOHN HOW, GERARD B. ALLEN, GILES F. FILLEY and N. J. EATON. They rented a large room on the corner of Fourth and St. Charles streets. in the Verandah building, fitted it up appropriately with book-cases, tables, reading-stands, and other furniture; bought six hundred volumes; received by donation about four hundred volumes; subscribed for the leading magazines and reviews; American and English, and many of the principal newspapers in the United States, and were furnished gratuitously with the Daily Republican, Democrat, Leader and Herald. The rooms were opened for use in the summer of 1855, after an expenditure of about three thousand dollars, generously contributed by a few persons interested in the enterprise.

Hardly had they succeeded in establishing the Library and Reading-room, before the want of free evening schools for apprentices, journeymen, clerks and other young men whose daily occupations gave them no other means of education, became so apparent, that they resolved to undertake that work also. It was, therefore, deemed advisable to give to their plan the full proportions which the Industrial Department of the University originally contemplated, and to shape its development towards the creation here of a full Polytechnic Institute, with the advantages, also, of the American Mechanic Institutes. In this direction the Board of Managers has been ever since steadily directing its efforts; and if its hopes are realized, the erection of the contemplated Hall will furnish immediate facilities for perfecting the general plan.

ORGANIZATION.

The first election for Managers was on the 7th of August, 1855, and the following gentlemen were constituted the first Board:

John How,
Gerard B. Allen,
Giles F. Filley,
N. J. Eaton,
Edward Bates,
W. B. Betts,
R. E. Carr,
J. B. Eads,
J. C. Evans,
J. S. Faucett,
J. T. Green,
A. Howe,
Robert Holmes,
W. A. Lynch,
C. A. Pope,
Wm. Palm,
W. C. Smith,
S. Treat,
F. Weston,
J. Grimsley.

At the first meeting of the Board, the Hon. John How was chosen President; Gerard B. Allen, Vice President; A. M. Anderson, Librarian and Secretary, and John Cavender, Treasurer.

In consequence of resignations and removals from the city, the Board for the second year was composed of the following gentlemen:

John How, President;
Gerard B. Allen, Vice Pres't;
D. K. Ferguson, Treasurer;
Edward Bates,
R. E. Carr,
N. J. Eaton,
Giles F. Filley,
J. B. Eads,
J. S. Faucett,
J. T. Green,
C. A. Pope,
S. Treat,
F. Weston,
Wm. S. Cuddy,
Rollin Clark,
R. M. Parks,
R. Dougherty,
J. J. Reynolds,
J. S. Wilgus,
Wm. Patrick.

The third and present Board, from changes made at the instance of those unable to give the requisite time therefor, is constituted as follows:

John How, President;
Gerard B. Allen, Vice Pres't;
Edward Bates,
R. E. Carr,
N. J. Eaton,
J. B. Eads,
J. S. Faucett,
J. T. Green,
C. A. Pope,
S. Treat,
F. Weston,
Wm. S. Cuddy,
D. K. Ferguson,
R. M. Parks,
R. Dougherty,
J. J. Reynolds,
Wm. Patrick,
R. Sellew,
Joseph O'Neil,
B. M. Runyan.

W. R. BABCOCK is the Librarian and Secretary; and HENRY COPP, Treasurer. Mr. BABCOCK was elected in March, 1857, on the resignation of Mr. A. M. ANDERSON.

At the first organization of the Board in 1855, the Institute adopted the name of "The O'Fallon Polytechnic Institute," as a becoming expression of respect for COL. O'FALLON, who had so liberally manifested his interest in the general purposes of the institution, and whose general worth in all that adorns the man and citizen entitles him to the highest regard of this whole community. The name "Polytechnic" is indicative of its design to embrace all the useful or industrial arts.

CONSTITUTION.

The constitution declares its object to be "the establishment of a library, of reading and conversation rooms, cabinet of models, etc., popular lectures on science and the mechanic and useful arts, an annual exhibition of Missouri manufactures, a school of design, a mathematical class, etc., etc." There is a Board of twenty Managers, sixteen of whom are annually elected by the members of the Institute. Any person may become a member by paying five dollars, annually; and if a journeyman mechanic or clerk, by paying three dollars annually, in advance. Any apprentice, or any person under eighteen years of age, can have the privileges of the Library and Reading Room on the payment of one dollar per year. A life membership is fifty dollars. The annual meeting is on the first Monday of November, each year; and the annual election on the second Monday of that month. The Board of Managers meets once in each month, and its members must be residents of St. Louis county. Ample provisions are made for the security of its property, and the proper conduct of its affairs.

LIBRARY AND READING ROOM.

The first movement of the Institute was the founding of a Library and Reading Room. By the contribution of a few gentlemen, six hundred volumes were bought, and about four hundred were donated, exclusive of two hundred which formerly belonged to the Apprentices' Association. The room, which is on the corner of Fourth and St. Charles, is open for members and subscribers from two to ten, P. M.

of each day, except Sundays. In less than a year from the date of its commencement the Library was increased about three hundred volumes, one hundred and seventy-seven of which (very valuable) were presented by Mr. BARNET WILLIAMS, and twenty-three, valued at one hundred dollars, by Mr. WM. H. BELCHER. The number of subscribers for the first eight months was two hundred and twenty-four, including one hundred and twenty-five members. The amount of money contributed was three thousand and seventy-two dollars. Books were given by Messrs. H. VINTON, W. G. ELIOT, WAYMAN CROW, WM. GLASGOW, JR., W. H. BELCHER, JOHN HOW, BARNET WILLIAMS, H. S. GEYER, T. H. BENTON, FRANK P. BLAIR, L. M. KENNETT, J. M. KRUM, and others.

Present number of volumes, 2617; 6 American monthlies, 5 European periodicals, 8 daily newspapers, 1 monthly paper, 15 bound volumes of papers. In addition, there is in the present Library, philosophical apparatus, expressly selected for popular lectures, and purchased by the Institute for that purpose. The value of its books, apparatus and furniture is about six thousand dollars.

The publishers of the Republican, Democrat, Leader and Herald have deserved the thanks of the Institute for their liberality in furnishing their papers gratuitously, and for many favors in the way of advertising and editorial notices.

The present number of annual members is one hundred and sixty-five; of subscribers, under eighteen years of age, one hundred and forty-nine; of scholars on certificates, seventy-five; Professors and Teachers in the University, eleven; life members, eleven; making the total, four hundred and nine.

DONORS.

Besides the munificent donation in land by COL. J. O'FALLON, already mentioned, and the gift of books by the gentlemen named, the liberality of the following principal donors has enabled the Institute to reach its present prosperous condition, and maintain with unexpected success its evening schools: JOHN HOW, O. D. FILLEY, WAYMAN CROW, G. F. FILLEY, R. SELLEW, J. B. EADS, W. M. MORRISON, DOWDELL, CARR & CO., H. AMES & CO., D. A. JANUARY, EADS & NELSON, JAMES HARRISON, B. W. ALEXANDER & CO., CLARK, RENFREW & CO., KINGSLAND & CUDDY, KINGSLAND & FERGUSON, ROBERT HOLMES, JOHN H. GAY, CLARK, PLANT & NORRIS, HENRY P. BLOW, ROBERT COOK.

COL. O'FALLON has also announced that it is his design to donate to the Institute ten acres of ground near Grand Avenue, and an invested fund of seventeen thousand dollars, making the amount contributed by him for this purpose over one hundred thousand dollars, in value. The whole value of the property belonging to the Institute will thus be about one hundred and fifty thousand dollars.

EVENING SCHOOLS.

During the winter of 1854–5, the University opened a free evening school, at the Benton School House on Sixth street, at which two hundred and seventy pupils were registered. Their average age was nineteen years; many being over twenty-one and some over forty years old. About forty per cent. of the number were born in the United States. This was considered an experiment; and it was thought, if twenty-five or thirty attended, it would be a satisfactory beginning. The result demonstrated, not only that there were many needing such facilities for education, but that large numbers were anxious, despite the fatigues of their daily toil, to avail themselves of any opportunity within their reach for receiving useful instruction. The same winter familiar lectures, illustrated with the philosophical apparatus, were delivered by PROF. A. W. SPRAGUE, of Boston, Mass., whose services had been obtained for the purpose. The total expense of the school that season was over thirteen hundred dollars.

The following winter, 1855–6, the Institute, as mentioned, took charge of this school enterprise. Four teachers were engaged for the purpose, it being supposed that one hundred and fifty scholars might be willing to attend. The design was not to make this a primary school for teaching rudiments, but a school for the instruction of apprentices, journeymen, clerks and others whose employments during the day gave them only the evenings for educational purposes—and for their instruction in more advanced studies, especially such as would be of constant use in their workshops, factories and counting rooms. The school was advertised to commence on the 15th of October, and public notice was given that applications would be received on the evenings of the 12th and 13th of the same month. On the night of the 12th, two hundred applicants were enrolled, and the number became so large on the evening of the 13th, that additional school rooms and four additional teachers were needed. The largest number wished to be taught the simplest elements of a common school education, some of them being over thirty years of age, and most from sixteen to twenty-five. Although the Board did not contemplate the opening of schools for that class of pupils; yet the fact of such applications, and from so many adults, was too strong an appeal to be resisted. When hundreds of young men, after the severe labors of the day, asked the poor privilege of being permitted to come from their workshops to a crowded school-room, to learn to read and write, and were eager to forego the usual and too often frivolous excitements of their companions; and when they were thus ready to make the necessary sacrifice of old habits and often of personal pride in being classed with mere lads, it was too small a boon to be denied. It vindicated the opinion expressed by the Managers from the commencement, that there was no lack of desire among the industrial classes for intellectual improvement, but merely a lack of adequate facilities.

The whole number enrolled during that winter was six hundred and twenty-eight; and the average age, eighteen. Of those scholars two hundred and twenty-three were born in the United States, one hundred and twenty-four in Germany, one hundred and eight in Ireland, sixty-five in England, fourteen in Scotland, seven in Switzerland, seven in Canada, six in Holland. Mexico, Wales, Prussia, Austria, Sweden, Netherlands, Isle of Man and Malacca were also represented. About seventy per cent. of the number were apprentices and journeymen mechanics. They were taught Arithmetic, Algebra, Grammar, Geography, Reading, Spelling, Writing, etc. Through the liberality of PROF. LITTON, they were permitted to attend, free of charge, his course of chemical lectures at the St. Louis Medical College. A similar favor was proffered by the other Professors of that College, with respect to the lectures delivered by them.

During the winter of 1856–7, five hundred and ninety-six scholars were admitted. They were divided into fourteen classes, under nine teachers. One fourth of the number learned to read and write. In addition to the common branches, as taught the previous years, the most advanced class was instructed at rooms in Washington University in Mechanical Drawing, the higher rules of Arithmetic, Algebra and Mensuration. A familiar course of lectures on Astronomy was given to that class by PROF. REYNOLDS, illustrated by the Planetarium at the High School. Mr. SCRIBNER gave the scholars many lessons in penmanship. Of that number, two hundred and twelve were born in the United States, one hundred and fifty-five in Germany, one hundred and fifteen in Ireland, sixty-four in England, eleven in Prussia, nine in Scotland, nine in France, five in Canada, two in the Isle of Man. The Isle of Jersey, Netherlands, Austria, Spain, Switzerland and Malacca were represented by one each. The average age was again eighteen—ranging generally from sixteen to twenty. About seventy per cent. were engaged in mechanical employments. That season the Board of Public Schools bore the whole expense. It has always furnished, free of cost, the rooms, light and fuel for these evening schools, and manifested a desire, so soon as the condition of its funds would justify, to provide for this growing educational want in St. Louis.

During the last winter, (1857–8,) the number of scholars registered, was seven hundred and sixty-eight. Eleven teachers were employed. An advanced class under the immediate instruction of Mr. N. D. Tirrell, was taught at Washington University, Algebra, Geometry and Mensuration; also, Industrial Drawing, by Mr. Hochelsy. The studies taught were Reading, Writing, Arithmetic, Grammar, Geometry, Algebra, Mensuration, Physical Geography and Industrial Drawing. One school was opened at the Benton School House, and one at the South Freemen's. Thirteen nationalities were represented, as follows: United States two hundred and fifty-four, Germany one hundred and sixty-four, Ireland one hundred and thirty-nine, England forty-nine, Scotland sixteen, Prussia seven, Canada seven, Holland three, France fourteen; also, Spain, Italy, Bohemia, Algiers and Switzerland. The average age was eighteen years and five months. Of the natives of the United States, fifty-seven were born in St. Louis. Of those who attended at the Benton School House, the following were their daily occupations.

Printers - - -	14	Paper Carriers, - -	7
Book Binders, - - -	1	Machinists, - - -	27
Wire Workers, - -	3	Locksmiths, - - -	1
Bakers, - - - -	5	Gas Fitters, - - -	13
Carpenters, - - -	50	Clerks, - - -	72
Saddlers, - - -	20	Safe Makers, - - -	3
Brick Layers, - -	7	Shoemakers, - -	11
Errand Boys, - - -	17	Pattern Makers, - -	4
Marketmen, - -	3	Wagon Makers, - -	5

Teamsters,	9
Laborers,	2
Barkeepers,	7
Mathematical Inst'nt Maker,	1
Burnishers,	3
Box Makers,	4
Bill Posters,	1
Moulders,	10
Lottery Ticket Dealers,	5
Carriage Makers,	8
Tinners,	6
Car Builders,	2
Jewelers,	2
Nailers	1
Millwrights,	1
Basket Makers,	1
Organ Builders,	1
Dyers,	1
Millers,	1
Ironmongers,	3
Blacksmiths,	18
Pedlers,	1
Plasterers,	5
Miners,	1
Soda Makers,	3
Turners,	2
Chair Makers,	2
Boiler Makers,	3
Sugar Refiner,	1
Tanners,	1
Unknown,	19
Copper Smiths,	8
Tobacconists,	31
Porters,	6
Telegraph Operators,	1
Marble Cutters,	1
Sheet Iron Manufacturers,	4
Coopers,	3
Painters,	15
Plumbers,	4
Tailors,	5
Butchers,	1
Stone Cutters,	2
Slaters,	1
Rope Makers,	2
Confectioners,	6
Bell Hangers,	1
Brush Makers,	1
Cabinet Makers,	6
Sawyers,	1
Silversmiths,	3
Founders,	10
Notion Dealers,	3
Waiters,	3
Watch Makers,	2
Finishers,	10
Tallow Chandlers,	1
Upholsterers,	1
Book Keepers,	1
Collectors,	1
Match Makers,	2

The following were the occupations of the Scholars at the South Freemen's School House :

Laborers,	100
Tobacconists,	13
Printers,	7
Carpenters,	17
Blacksmiths,	10
Machinists,	15
Shoemakers,	4
Saddlers,	25
Painters,	3
Various Trades,	35

Seventy-eight industrial pursuits sent young men to these schools, during the last season, showing how widely extended their usefulness has been.

Thus, two thousand two hundred and sixty-two young men, whose ages average over eighteen years, have been enrolled in these free evening schools, during the past four years. The general expense for the first winter was borne by Washington University, and for the third winter the whole expense by the Board of Public Schools. During the other two winters, the schools have been maintained, at an expense to the Institute, of three thousand five hundred and thirty-nine dollars. From the beginning the immediate direction of these schools has been entrusted to Messrs. Low and Tirrell, who have, by their energy, fidelity, experience and attainments,—assisted as they have been by other competent and faithful teachers,—advanced the pupils with a degree of accuracy and rapidity, alike unexpected and gratifying.

At the close of each session certificates were presented to a selected number of scholars, expressing the approbation of the Board and Teachers, of their dilligence, gentlemanly deportment and progress. Those receiving certificates are thereby entitled to all the privileges of the Library and Reading Room for one year. The use made of those privileges evinces a desire for continued improvement. The paths of more extended culture and usefulness have thus been opened to many worthy young men, who, without this aid, would have been left destitute of this intellectual enjoyment, and of the surest means of self-progress, not in their respective pursuits alone, but in all the walks of society.

At the close of the evening schools for each season, appropriate addresses have been made, before the distribution of the diplomas, and generally by the Board of Managers. Among those who have thus addressed the students and the audiences present, are Messrs. How, Bates, Pope and Treat, of the Board; and Messrs. J. W. Tucker, H. E. Bridge and the Rev. Dr. Eliot.

The whole cost of these evening schools for the last four years has been about seven thousand dollars. As two thousand two hundred and sixty-two scholars have been enrolled, and the punctual attendance of more than half of that number secured, the average cost for each enrolled scholar was about three dollars, and reckoning only those who attended regularly during each winter, about five dollars.

A large majority of these scholars have come from the mechanical pursuits of the city; and in the ordinary course of business are destined to assume responsible positions in their respective callings; directing the labor of others, and giving tone and shape to many departments of St. Louis enterprise. The necessity for meeting the demand for primary instruction has lessened the intended efforts to secure full classes in the more advanced studies; yet the numbers who, during the last two years, have attended to the higher rules of Arithmetic, and to Algebra, Geometry, ordinary Mensuration and Industrial Drawing, and the still greater numbers now prepared for a more advanced course, indicate that the direction towards which educational effort should be applied by the Institute, is as originally contemplated. As has been stated, the design of the Institute includes classes in mathematics, mechanics, chemistry and other abstract and applied sciences, as well as industrial drawing, etc., so that journeymen and apprentices may have a clear knowledge of the fundamental principles they are daily applying; and thus work out, more intelligently, the results intended by their labor and skill. Nearly every mechanical art involves pure mathematics; and although fair progress in the workshops may be made under an ordinary knowledge of mathematical rules, yet a *thorough* acquaintance with the *principles* is essential to larger development, and the greatest skill. Mechanics, as a study, is applied mathematics. The manual skill and dexterity acquired in the workshop are indispensible to success; but, that they may be rightly and successfully applied, and especially in the new operations constantly demanded, both employer and employed should be masters of the principles on which successful results are based. The laws which govern forces in their action, the various modes of applying those forces so as to produce the maximum result with the least labor or expense, the mathematical certainty with which the various mechanical powers operate, the principles upon which the forms of materials depend for strength or power of resistence, in different direction or under different circumstances—in brief, the precisely accurate determination of the maximum of force or strength to be obtained, with the minimum expenditure of material, labor or cost, involve necessarily a thorough knowledge of mathematics. The application of that knowledge to the materials used, the processes adopted, the machines constructed, or daily employed, and to the preparations for working the same, makes the mechanic arts the most learned of human occupations, and gives to them a power of progress not dependent on mere chance experiments or accidental discoveries. A mathematical class, properly instructed, will have the means of unraveling many a perplexing difficulty, and what is of no less moment, acquire thereby complete mastery of the instruments or tools which are necessarily used from hour to hour, and without which the more important works can be neither accurately planned nor completed. Those instruments are made according to mathematical rules, and are shaped in accordance with fixed laws. The forces applied to or by machinery—no matter what the primary source—whether animal power, water, steam, coal, or the most subtle elements, act in rigid obedience to well established and known mechanical laws. Materials are not chosen at random, but for their peculiar chemical or mechanical properties. The modes of combining parts of the same or different materials, so as to give the requisite strength, or durability, or facility of motion, or direction of force, demand a knowledge of principles which lie behind mere muscular effort or manual skill. It is not meant, that every apprentice or journeyman must necessarily go through the elaborate and severe course of study for which provision is made only in the highest institutions of learning. The Washington University, for instance, in its Collegiate and Scientific Departments, is designed to give the highest instruction in every branch of knowledge; and while it is hoped, that many of our future farmers, mechanics, miners and manufacturers will come into business with all the intellectual resources to be thus procured, yet it is not to be expected that the mathematical and other classes in the Institute will, at first aspire to more than that essential degree of scientific knowledge which will enable them to comprehend and rightly use the principles of more frequent application in their business pursuits. In this way the needed information will also become more widely diffused. The character of the more advanced pupils in the evening schools—their maturity of judgment, habits of observation, daily handling of scientific and mathematical rules and principles—demonstrate that they are of the right material from which to work out these higher ends. All occupations and nationalities are represented. The processes known to the workshops of nearly all civilized nations are used in the various workshops of our city. The elementary principles on which they are founded, or from which they spring are the same. It is but reasonable to suppose that a better knowledge of their multiform applications will prevail through the agency of the classes instructed in the Institute, and more particularly through the interchange of thought in the Conversation Rooms. The general views presented in a subsequent part of this report will more fully illustrate the importance to proprietors, journeymen, apprentices —to all engaged directly or indirectly in industrial pursuits—of bringing together for free and full intercommunication of ideas the scientific and practical, the savan and operative, the theorist and the artisan. The evening classes to which reference is made, will prepare the less skilled and informed, to become better managers and more successful proprietors of large establishments—to be ready to plan their own work, and to either execute in person, or direct the execution by others, of those diversified operations going on wherever a large working establishment exists. Surely, if the comparatively small sum expended on each scholar in the evening schools of the last four years, whilst their instruction was mostly primary, has been productive of so beneficial a result as that already witnessed, it is not unreasonable to anticipate the largest and best consequences, from the future classes in pure and applied mathematics, in industrial drawing, in theoretical and practical chemistry, in the various physical sciences and their useful applications—in a word, in every department of technology, when assisted with the necessary apparatus and appliances for making the students familiar with their details, and when instructed by competent scientific and practical men.

SCHOLARSHIPS.

Among the many advantages derived from the mode of organization already considered, not the smallest is the endowment of eight scholarships, in Washington University, the appointments of which are conferred on the Institute. As the University course is intended to embrace four years of preparation, four years of collegiate study and three years in scientific instruction, each of the eight studenst appointed by the Institute has an unwonted opportunity for a thorough collegiate, scientific education—such as will qualify him for a proper discharge of his duties in any subsequent pursuit. It has been the desire of the Board in filling these scholarships, to secure as far as practicable, the main object designated, viz : the highest culture for the mechanical, manufacturing and other industrial callings. Hence, in each case, it has been the wish to select from the various applicants, those whose moral and intellectual habits, and whose inclinations, lead them to continue at the University throughout the entire course of study, and subsequently to engage in some industrial vocation.

These scholarships were founded, and the right of appointment to them conferred upon the institute, by Messrs. WAYMAN CROW, GEO. PARTRIDGE, JAMES SMITH, JOHN CAVENDER, WM H. SMITH, JOHN TILDEN and CHRISTOPHER RHODES.

The following young gentlemen now fill the scholarships, some of them having been appointed at an early day: JOHN KNIGHT, GEORGE A. DWELLE, JOSEPH M. PETTUS, CHARLES KREUTZINGER, WILBUR F. BARRELL, EDWARD M. DUNN, GUSTAVUS HOSTIS and JOHN H. DILL.

The new Laboratory just completed by the University and furnished with the best apparatus that could be procured in Europe, and the selection of Prof. A. LITTON to fill the chair of Analytical and Industrial Chemistry, also the procurement of Prof. J. J. REYNOLDS' services for the chair of Mathematics, Mechanics, and Civil Engineering, together with the establishment of Professorships of Geology and Mineralogy, Agriculture and Physical Geography, Mining and Metallurgy, to be filled hereafter, as the wants of the students may require; also the chairs of Natural History and Botany, and of Comparative Anatomy now filled by Profs. ENGELMAN and POPE—give assurance that full intellectual training can be had for any industrial or business occupation; that the Institute will be able to call to its aid when needed, the highest order of scientific attainment and research, and the pupils appointed to the foregoing scholarships have advantages, which, if properly used, will place them at the head of their respective pursuits. On those pupils, reliance is had to vindicate the correctness of the views entertained with regard to the influence of the highest intellectual culture upon the industrial arts.

LECTURES.

The plan of the Institute contemplates regular courses of lectures on the sciences, arts and other useful subjects. In the future development of its design, it is expected ample provision will be made for that purpose. It was intended during the last winter to commence a course upon more general, yet instructive subjects, with a view of inaugurating that leading feature of the Institute; but the unexpected financial difficulties during the fall and winter, led to their postponement until next season. A number of able and eloquent citizens had accepted the invitations extended to them, and it is confidently anticipated that next season lectures will be delivered, as previously arranged by the following gentlemen:

Hon. Edward Bates,
Prof. T. M. Post,
Prof. A. Litton,
Rev. Dr. W. G. Eliot,
J. B. Eads, Esq.,
Hon. E. A. Hannegan,
Prof. J. J. Reynolds,
Prof. C. A. Pope,
Wm. Palm, Esq.,
Hon. John How,

THE INSTITUTE HALL.

A few weeks ago there was furnished as a site for the Institute Hall, a lot of land fronting upon Chesnut street, at the corner of Seventh street, one hundred and thirty-five feet front by one hundred and nine feet six inches deep, to an alley fifteen feet in width. That lot was given to the Institute by a gentleman whose name, it is regretted, he has insisted upon withholding from the public. It comes to the Institute free from all incumbrance. Its cost was thirty-three thousand seven hundred and fifty dollars. The Board of Managers intend to erect a suitable edifice there without delay. A committee has been appointed to designate, under the direction of the Board, the general purposes for which the building is to be constructed, and to advertise hereafter for plans suitable to effect the purposes designated. A premium of $300 will be given for the best plan, and of $100 for the second.

It is obvious that the important objects contemplated by the Institute, demand an edifice for its own use, and built with especial reference to its purposes. The Industrial Departments of St. Louis need their appropriate Library, Conversation, Reading, Lecture and Model or Exhibition Rooms, Cabinets, etc., etc. A building for their use should be in a central part of the city. It should contain appropriate arrangements and ample provisions for the various wants of the industrial classes. It should be the common resort, both of men of science and of men engaged in all departments of active enterprise and industry. They should there meet to interchange views, make useful suggestions, consult a well stored library, examine proper models and the useful inventions which may be exhibited, make satisfactory tests of the strength and durability of materials, learn the results of such analyses as they may desire, be furnished in the mathematical classes, or in the school of design, or in the mechanical and philosophical rooms, the needed instruction for themselves and their journeymen and apprentices. The erection of a suitable edifice, it is not doubted, will soon furnish the means of putting fully into practical operation, the leading and more important features of the plan which the Board has had steadily in view from the moment of its organization. The assurances already given leave but little room for doubt that such a Hall will be commenced this spring, and pushed forward as rapidly as practicable. It is for those most directly connected with industrial pursuits and with the prosperity of St. Louis—for the mechanics, manufacturers, merchants, owners of real estate and the proprietors of mines in this and adjoining states--to secure the early accomplishment of this important object.

GENERAL VIEWS.

The general design of the Institute has been stated; yet additional suggestions may cause its main purposes to be more directly understood and appreciated. In maturing details, hereafter, and in the continued prosecution of a public enterprise so large in its range of action, the views presented from time to time by practical and scientific men will unquestionably furnish valuable information of which the Managers will be glad to avail themselves. In commencing such a work, it is important that whatever is done, should be in harmony with the general purposes, and not interpose obstacles to the fullest development hereafter of any new department of industry or research The plan should be adapted to the wants of the present age, and capable of expansion to meet the requirements of coming ages. New discoveries in science, new applications of principles already discovered, new fields of research, more wonderful inventions, the use of materials now thought worthless, and new combinations and analyses will enlarge the domain to be occupied by a Polytechnic Institute, and may give its operations new directions and increased means of usefulness. At present, however, the following views presented in a former report to the Institute, deserve to be more generally considered.

"The Institute originated in a desire to found an Institution which would prove advantageous to the industrial classes, by placing within their reach the benefits of a more thorough education, designed with particular reference to practical usefulness, the development of mechanical skill, the promotion of the useful arts, the encouragement of manufacturing enterprises, and the inculcation of sound and virtuous principles. The chief means intended to further those objects, are the establishment of a library, reading and conversation rooms, cabinet of models, minerals, etc., popular lectures on the sciences, mechanics, philosophy and the useful arts, an annual exhibition of Missouri manufactures, free night schools, a school of design and a mathematical class.

It seems to us that the time has come when a broader and more liberal view of the educational wants of our age and country should be taken — when mechanics, manufacturers, merchants, miners, farmers, boatmen—in a word, when all who are in any wise associated with material and industrial pursuits, should insist upon having for themselves all the facilities necessary to a thorough training, at least in those natural sciences and kindred studies, on the full knowledge and right application of which the success of their daily enterprise so largely depends. Every person in the workshops of our city is constantly using, in his department of labor, some mathematical, philosophical or scientific principle, the mastery of which would save him from much useless experimenting, and the loss both of time and valuable materials. If we could estimate, with mathematical precision, the value of the raw materials and labor uselessly expended each day, the loss of which would have been avoided had the workmen possessed a fair knowledge of the scientific and philosophical principles involved, it would be found that at least one-third of the whole is actually wasted. Yet many workmen possess a large fund of knowledge, acquired by toilsome and expensive experiments in the workshops, particularly with reference to the special processes of their respective arts, which remain unknown to the scientific world; and in the direction of the daily labor of their employees, or of those under their management, they are among the best and in most cases the only teachers large numbers of their fellow workmen ever have. In the libraries, and laboratories, and universities of the country, on the other hand, are garnered up untold treasures of facts and principles, which if drawn out of their comparatively hidden recesses and diffused through the workshops and along the busy avenues of trade

—made to come into constant and immediate contact with operative industry—would give an unimagined impulse to all the useful arts, and rapidly advance the nation in its material, intellectual and moral power and prosperity. It is no new complaint that science, in the hands of its devotees, rests too much in the region of abstract truth and speculation, instead of being closely wedded to productive industry—that whilst the latter is daily testing the accuracy of the former and applying its truths to practical ends, it has not hitherto been deemed sufficiently important that those to whom the application is entrusted, should be properly trained therefor by a fitting study of the natural laws, and physical agencies, and mechanical principles, with which they are constantly dealing. And it is equally to be regretted that the devotee of science, in exploring the secrets of the universe, does not deem it necessary to descend from abstract investigations, to superintend or even observe the daily workings of his scientific discoveries in the various departments of physical labor. To no inconsiderable extent, this has been owing to the false and imperfect views of liberal education which have obtained in the learned world and especially in the higher institutions—our colleges and universities. Whilst polytechnic, and mining, and agricultural schools have sprung up in England,France and Germany, to meet the wants of our utilitarian age ; but little has been done in this country to meet the still larger and more pressing want here. Our free school system has given many advantages, the fruits of which are to be seen, not only in the Patent Office, but wherever labor-saving machinery is employed. Still, only a small step has been taken in the right direction—education does not stop with the school-room. Essential as are school discipline and training, it is obvious that by far the largest portion of useful knowledge distributed through society, was acquired after the school-days had terminated. Hence the need that school education should receive a practical direction, and be largely extended, and that the fruits of mature experience, should not be confined to individual possessors. Highly educated labor is needed alike on the farms of our country, in its mines, along its avenues of trade, in its workshops, at the counter and in the public marts. In modern society, the mechanics, manufacturers, farmers, merchants, miners—those who move the wheels of national industry, and give to individual and associated enterprise its warm and healthy activity—ought to be the educated classes, learned, not so much it may be in mere scholastic or literary studies, as in all that pertains scientifically and practically to their respective departments of industry. It is true this requires an extended range of thought and study; for all the sciences are near of kin to each other: but who should be so familiar with the laws of matter as he whose daily task it is to handle and adapt it, in all its varied and changing forms, to answer the never ceasing wants of the age? We do not decry or underrate classical or literary acquirements, or any branch of learning; nor do we deny the so-called learned professions their just claims: we merely assert for the workshops and industrial pursuits their right to a corresponding degree of intellectual culture, appropriately directed to their departments or callings in life.

A moment's reflection upon the present and prospective condition of St. Louis, will justify our views. Situated in the midst of the great Mississippi valley, the richest agricultural and mineral region on the globe; with navigable rivers extending in every direction, and bearing, even now, a commerce far larger than the whole foreign trade of the Union; with railroads, tending to and stretching from her wherever her multiplying necessities demand; with the richest deposits of coal, iron, lead and copper, almost at her very doors—who can state, in too extravagant terms, her future destiny in commerce and manufactures, if her citizens are true to themselves? If, then, her material advantages are so vast, and promise so brilliant a future; if she is to become, as is hoped, the principal workshop of this great valley, is it not obvious that we have no time to lose in fitting for their task those upon whose knowledge, energy and skill, her greatness and prosperity are to depend.

It is but recently that our practical miners learned, that through a lack of a little scientific knowledge they had been laboring for years to destroy, as useless, a large portion of the most valuable products of their mining operations. So, in our workshops, men often toil for months, and it may be years, in random experiment to detect some better or less expensive mode of manufacturing a desired fabric, when the knowledge of a few simple truths in mechanics or chemistry would have taught them that all their misdirected efforts must end in disappointment, whilst an easy and cheap remedy or agent was waiting at their hands ready for use. If the coming generations of St. Louis mechanics and manufacturers, and business men in all pursuits, are thoroughly educated for their respective callings, our city will add to its material, such superior educational advantages as will enable her far to outstrip her many rivals. If all workmen, from the proprietor and foreman to the youngest apprentice, combined with their manual skill and dexterity a thorough knowledge of the mechanical laws, and of the properties, both mechanical and chemical, of the various substances on which they work; knew how to avail themselves, to the greatest advantage, of every principle, property and agency in nature, in short, if science and art should unite and work together, in and through the same person, who could place a limit to the progress of either,—to their expansion and growth, under such never ceasing action and re-action on each other? And what, as yet, unimagined and wonderful discoveries in science and productions of inventive genius, might not flow therefrom? The boundary line between the discovered and undiscovered is at our feet always, and one stride properly taken, may pass us safely over. And who would be so likely to take that stride as he whose mind is thoroughly trained in all departments of scientific inquiry, and whose manual skill has been acquired by a life long employment among those very substances and agencies out of which the unknown and hidden truth is to be dragged to light?

The amount of knowledge already in our workshops was obtained, generally, after long, tedious and expensive experimenting, and is too often imparted to workmen by a like slow process. Hence, the importance of a frequent interchange of information among the workmen themselves, as well as between the workmen and those learned in science. Ample facilities for such an interchange of thought ought to exist in every city; and it is one of the principal objects of the Institute to furnish them to St. Louis. It is thus each can become both a teacher and a pupil, alternately imparting and receiving the most useful hints and practical information. Their ability to thus teach, and their need to be thus instructed, none know better than themselves. The process is going on daily in every establishment where several men are employed. The sum of sound knowledge distributed through the workshops has never been properly appreciated; and never will be until the workmen meet and interchange views with each other. Each has much to teach and much to learn; and the same may be said of every other useful citizen. By freely associating with each other in a common library, and reading and conversation room, and occasionally listening to an able lecture on some of the sciences or useful arts; by having at their command the best treatises on the subjects they wish to investigate, ample means of testing the accuracy and utility of their observations by comparing the results of their experience and experiments; by an examination of the best models and the use of proper philosophical apparatus in pushing their investigations, they will not only stimulate research among themselves, but give to each the benefit of the combined researches of all. And, hereafter, it may be thought proper to secure for the Institute, in furtherance of its general design, the services of some one thoroughly qualified therefor, whose duty it shall be to answer the inquiries that may come from the workshops of the city; to explain the principles involved, test the quality of materials used, analyse them when required, and subject to scientific examination and experiment every new and doubtful process in art.

The field of action proposed by the Institute has been but slightly explored. It is the field of American industry, left hitherto, for the most part, without the aid which science should furnish, or that associated effort could give. The so-called learned professions have not only libraries written upon their respective pursuits, or departments of thought and research, but frequent gatherings at which each contributes to the common stock the fruits of his severer studies, observation and experience. Thus they have continued to advance with rapid strides, placing under contribution all the intellectual powers of each member of the profession—laying hold of and appropriating to their own use all the treasures of science, philosophy, letters and art. A similar mode of progress should be adopted by those engaged in industrial pursuits. In addition to the many books written already upon the useful arts, there are numberless unwritten volumes scattered through the workshops, as yet unknown to book-wrights, and unrevealed to the popular lecturer. Those scattered treasures of knowledge can be discovered, accumulated, and made to yield a large product daily—to answer often in the various workshops and manufactories of the city, all the purposes of the best labor-saving inventions of the age.

But enough has been said to unfold the main or leading design of the Institute. It addresses itself to every citizen in the community, but with especial force to those who are employed in the industrial arts of St. Louis. Every such person should become a member, and contribute by his energy, zeal, information and experience to push forward the enterprise with vigor; to enable it as soon as possible to attain the proportions and accomplish the purposes contemplated by its organization. Its success thus far has been great, although public attention has scarcely been directed to it. Silently it has worked on, educating about twenty-two hundred and fifty apprentices and journeymen, accumulating twenty-seven hundred well selected books, and preparing for greater usefulness in the future. With proper co-operation on the part of those who are seldom found to hesitate when a good work is to be done, the Institute cannot fail in the course of a few years to become all that its patrons fondly expect of it.

To the manufacturer, master, mechanic and employer, the advantages of such an Institution in our midst must be apparent. The annual exhibition of the manufactures and mechanical products of the city ; the facility afforded for the sale of our fabrics ; the opportunity of comparing each other's skill and progress ; the mutual interchange of ideas and kindly feelings ; are a few only of the direct benefits. The greatest advantage will be found in the employment of highly educated workmen, who understand the chemical properties and changes in the materials upon which they are operating, the mechanical principles involved in every machine and tool they use, the mathematical computations required in laying out work, the drawings of plans and designs, and how to make the best use of the varied knowledge thus possessed ; and more than all, whose brightened intellects have shown them the truth, (so seldom understood,) that the interests of the operative and his employer are one and the same.

In a city where so many allurements of sin and folly exist, no capitalist, employer, or good citizen, and especially no operative, who understands and prizes rightly his own capacities, powers and worth, can feel indifferent to the success of an Institution which offers, free of cost, to all working men in the city, the rich blessings of good academical instruction, and the attractions of the library and reading room with all their elevating influences ; and which opens to them the lecture room, where science with her facinating developments, immutable laws, and wonder-working results, arouses curiosity, stimulates investigation, and calls into action every latent power of the intellect. To one brought under influences like these, vice and ignorance have no charms—their worthlessness and deformity stand unveiled. New and holier attractions will lead many to pass their idle hours where rich stores of thought can be accumulated, to lighten labor and make it still more profitable ; where the pleasures of the intellect will destroy all relish for mere sensual pleasure ; where the moral nature will rise and assert its supremacy over the material and physical.

If the statesman, the lawyer and the physician, seek the aids of science and literature, the mechanic surely has weightier reasons for doing so. In every department of industry, the results of scientific research are directly applicable, and in no position in life are the enjoyments of literature more appropriate and necessary. Whilst pondering upon the demonstrations of the lecture room, or investigating those scientific principles directly involved in his trade, he may find himself upon the threshold of some brilliant discovery, increasing the measure of human happiness and securing imperishable fame for himself. In an age like the present, when progress is the leading feature in everything, and every known physical element is being made subservient to man; when the air, the river, the ocean, and the land, are each offering such splendid rewards to scientific discovery and skilful mechanism, it becomes no one to be idle or indifferent. The history of the world is gemmed with the brilliant examples of what mechanics have done, when the auxiliary sciences were unknown. It is the duty of the present age to show what mechanics can do, when aided by the recorded experience of the past, and guided by the light that philosophy sheds along their pathway. By having their own library, lecture room, night schools, popular lectures, cabinet of models, scientific apparatus, annual exhibitions, etc., and by their united endeavors to extend the blessings of sound, useful and practical knowledge to the whole industrial community, they will not only elevate themselves and confer increased dignity upon labor, but will secure for their own profit and enjoyment the untold pleasures of moral and intellectual culture, and become as public benefactors worthy of the enduring gratitude of the community and the age.

The general views thus presented must commend themselves to every liberal minded and right thinking man. And why shall not St. Louis commence at once, with its accustomed energy the next great step towards the attainment of so beneficent an end? It would be a marvel if those who most feel the need of a higher intellectual culture—whose daily pursuits and earnest aspirations beget an incessant craving for a deeper insight into the mysteries of nature—who appreciate, in all their power, the wonder-working results of modern discovery and invention—who are wont to measure the coal exhumed from neighboring fields and cliffs, by the muscular force it equals and economizes—who anticipate the fast coming day when mountains of iron, veins of copper and lead, beds of kaolin, zinc without stint, and measures of coal, shall meet in this city as in a busy workshop to be wrought into the most coveted results of human skill and industry—it *would* be a marvel indeed, if they delayed the necessary preparation for meeting that fast dawning future with the power to master its vast resources and tear from them the untold wealth they bring! Science and industrial skill have hardly touched the immense natural productions within the reach of St. Louis. The united skill of our artisans and savans should be brought to the work. Each in his own sphere knows what the other lacks; and what neither knows now, their combined suggestions may lead both to discover. There is no place on the earth where educated labor has a more inviting field for action—none where more munificent rewards are in store. But there must be a beginning for every movement, and the first step now wanting is a common centre of action—some common ground where manual skill, daily experience and careful, pains-taking labor can grapple with the revealed agencies of nature, and where science can at the same time shed its clear light along those hitherto hidden or obscure paths in which muscular effort has too often lost itself by groping forward without any guiding clue to the labyrinths it sought to explore.

Our modes of building, our machinery, our preparation of fuel, our illuminating arts, our means of travel and transportation—all that we daily use and need of physical comfort and progress,—wonderful as they appear, in comparison with what only a century ago were the products of individual thought and toil—merely foreshadow the greater improvements which the next half century of educated and concentrated intellectual energy will create. Here in the central city of this valley, where commercial will soon be rivaled by manufacturing enterprise, it is peculiarly fit that the first Polytechnic Institute of America should be established, so that keeping pace with, or leading in, the development of mechanical skill and power, her workmen of all pursuits may be the true pioneers in every great movement of this busy age.

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